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Introduction

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For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT INTERNATIONAL STANDARD

ISO/IEC DIS 4932

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Information technology — Learning, education and training — Access For All Metadata: Accessibility Core Terms (AfA-core-terms)

ICS: 35.240.90

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 36, *Information Technology for Learning, Education, and Training*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 Purpose and Overview

ISO/IEC 4932 is intended to facilitate the matching of resources to individual users' needs using a description of accessibility characteristics of resources chosen by the user. It will enable accessibility services providing automatic matching of resources and resource components to individual user's accessibility needs and preferences.

The properties and definitions within ISO/IEC 4932 are functional; the matching can be involved in the discovery, delivery and refinement of a resource (service, product or environment) for an individual user, in a given context, for a specific goal. The standard recognizes and supports human diversity. It should not be used to evaluate resources, services or environments with respect to general accessibility, usability or other measures of quality.

Within ISO/IEC 4932, disability is defined as the mismatch between the individual user's stated needs and preferences and the resources, services or environment delivered.

The functional requirements of an individual may be influenced at different times by factors such as the user's context or environment, technical requirements of the user's device, the tools or supports available (e.g., assistive technologies or an assistant), the user's background or training, the goal the user wishes to pursue, or an impairment (disability in the traditional medical sense). It should be noted that non-digital forms of resources may be involved.

Recognizing the range of possibilities, the focus of the standard is to support a process that enables extensible, open and accessible registration of needs and preferences that can be presented as metadata in multiple languages and vocabularies familiar to each user while maintaining interoperability.

The standard defines a core set of Access For All properties (AfA properties) for description of the accessibility characteristics of resources and their components as a MLR Application Profile (ISO/IEC 19788-1). As with metadata defining the subject of a resource (ISO/IEC 19788-2), the property noting the provision of text alternatives for images, for example, is available for matching the resource to the user's needs and preferences. Hence the properties are intended for use also in the description of user functional requirements (needs and preferences).

The AfA properties will be sufficient in many circumstances, but where there is additional information available, or other needs, preferences or resource attributes to be described, additional terms conformant to this standard, and thus ISO/IEC 19788-1, can be defined and used without loss of interoperability.

It should be noted that when resources in their initial form lack accessibility for a user, this may be corrected by the identification or creation of a needed accessible component that can be integrated with the original by a suitable computer service.

0.2 Granularity and refinements

From a data perspective, precision is known as "granularity". In some cases, precision is necessary to avoid ambiguity, in others to increase interoperability, and in yet others to increase local utility, for example. This principle supports global interoperability at the same time as local specificity. The level of granularity required depends on the circumstances and user requirements.

Whether using an assistive technology or not, user needs and preferences of individuals with a disability (from a medical perspective) are frequently very particular with little or no room for variance. A slight variation in font size, button (physical or digital) size, or colour, for example, can be the difference between an accessible resource and an unusable one. Ensuring access for users whose choice of access modes is restricted by impairment often requires exact matching of a resource with a user's requirements: in such a case it is not a matter of convenience or optional refinement but one of utmost importance (from ISO 24751-1:2008:4).

The AfA properties recognize the need for granularity in the field of accessibility. For this reason, definitions of properties will indicate, where relevant, if they are refinements of other terms. An example of a use for an extension for detail might be to accommodate two types of users in a resource description: the expert user who is competent to change the font size and color of a resource (where possible) and another user who needs the particular font size and color to be delivered.

Types of user extensions include:

- the addition of a property required in addition to those specified in ISO/IEC 4932;
- the addition of a property that refines one of those specified in ISO/IEC 4932.

A user extension that attracts widespread and common use may become a candidate for inclusion and incorporation into this or a future version (e.g., in a new part or later edition).

0.3 Use of existing international standards and specifications

A key strategy in the development and maintenance of this standard is using relevant international standards and specifications (or applicable parts thereof) to the greatest degree possible. In particular, ISO/IEC 4932 adopts the framework in ISO/IEC 19788-1 and uses it to define some AfA properties tested and adopted by an international community including those contributing to IMS Global work, the development of ISO/IEC 24751-1, and the schema.org metadata model.

It is expected that AfA properties will be used in combination with others that describe attributes of resources such as the subject of the resource, the date of the resource, the creator of the resource, etc. For these purposes, the properties specified in ISO/IEC 19788 Metadata for Learning Resources and ISO/IEC 15836 Information and documentation – The Dublin Core metadata element set are recommended.

In particular, ISO/IEC 4932 aims to maximize compatibility with existing standards such as IEEE 1484.12.1-2002 (LOM), ISO 15836-1:2017 (Information and documentation – The Dublin Core metadata element set), ISO/IEC 19788 (MLR), W3C Resource Description Framework, EPUB, and schema.org specifications so that users of these standards can migrate or mix-and-match data from one context to another in an efficient and cost effective manner.

Information technology — Learning, education and training — Access For All Metadata: Accessibility Core Terms (AfA-core-terms)

1 Scope

This standard specifies a common, interoperable set of extensible properties for the description of resource content and functionality and user needs and preferences, to enable network-supported individualization of resources, services and environments to match the unique needs and preferences of the individual.

The standard includes all relevant mechanisms for the publication of terminology for such descriptions, including publicly available registries of properties and related metadata resources such as application profiles.

ISO/IEC 4932 takes an inclusive approach to individualization, since any user can experience a mismatch of their individual needs and preferences and the content or services delivered; it is not restricted to descriptions related to stereotypical notions of disability.

ISO/IEC 4932 defines a set of core AfA properties that can be used in a Digital Resource Description, an AfA record, and equally in a stored Personal Needs and Preferences profile, also an AfA record.

This standard aims to maximize conformance of AfA properties with ISO/IEC 19788, Metadata for Learning Resources. That standard conforms to the W3C Resource Description Framework so this standard will too.

1.1 Exclusions

This standard provides properties for describing access attributes of resources. It does not ascribe medical conditions to such properties. For example, 'non-visual' as a property value does not infer visual disability, it may be the user's eyes are busy watching the road.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 639-2:1998, *Codes for the representation of names of languages — Part 2: Alpha-3 code/Codes pour la représentation des noms de langue – Partie 2: Code alpha-3*

IETF BCP 47 *Language Tags*

ISO 639-3:2007, (E) *Codes for the representation of names of languages — Part 3: Alpha-3 code code for comprehensive coverage of languages (Registration Authority is SIL International: the Home Web page for ISO 639-3 is ¹⁾,)*

ISO 3166-1:2006, (E/F) *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes/Codes pour la représentation des noms de pays et de leurs subdivisions – Partie 1: Codes de pays*

ISO/IEC 15836:2009, (E) *Information and documentation — The Dublin Core metadata element set*

1) <https://www.sil.org/iso639-3/>

ISO/IEC 19788-1, *Information technology — Learning, education and training — Metadata for learning resources-Part 1 Framework*.

ISO/IEC 24751-1:2008, *Information technology — Learning, education and training — Access For All Accessibility — Part 1: Framework and reference model*

3 Terms and definitions

For the purposes of this document, the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Terms from ISO/IEC 24751-1:2008

The following terms are used in this standard:

access for all (AfA), accessibility, assistive technology, disability (resource delivery), disability (medical perspective), display, individual, usability

3.2 Terms from ISO/IEC 19788-1:2008

The following terms from ISO/IEC 19788-1 are explicit in this standard:

resource, information resource, MLR application profile, application profile record, attribute, attribute value, metadata

The definitions of all other terms in ISO/IEC 19788-1 are adopted for this standard.

3.3 New terms and definitions

3.3.1

AccessForAll property

AfA property

unit of data for use in the description of the accessibility (3.1) characteristics of a *resource*

Note 1 to entry: Based on ISO/IEC 19788-1.

Note 2 to entry: In the case of AccessForAll, the two main use cases, search and delivery, use the same properties. They are for users in resource discovery processes and resource providers in publication processes..

3.3.2

AfA digital resource description

DRD

set of values of AfA properties as a MLR record (ISO/IEC 19788-1:2011, 3.24) describing the accessibility characteristics of a resource (ISO/IEC 19788-1:2011, 3.30) (and resources directly related to that resource)

Note 1 to entry: A set can be a single value.

Note 2 to entry: A DRD could be included in another record.

3.3.3**AfA personal needs and preferences****PNP**

set of values of AfA properties as a MLR record (ISO/IEC 19788-1:2011, 3.24) describing an individual user's required accessibility characteristics of a resource (ISO/IEC 19788-1:2011, 3.30) (and resources directly related to that resource)

Note 1 to entry: A set can be a single value.

Note 2 to entry: A PNP can be included in another record.

Note 3 to entry: A PNP is similar to an AfA preference concept as used in ISO/IEC 24751-4, 3.7.

4 Symbols and abbreviated terms

AfA	Access For All
API	Application Programming Interface
DRD	Digital Resource Description
ID	Identifier
LOM	Learning Object Metadata
MLR	Metadata for Learning Resources
PNP	Personal Needs and Preferences
URI	Uniform Resource Identifier
WCAG	Web Content Accessibility Guidelines

5 Resource classes from ISO/IEC 19788-1**5.1 Resource class "Resource"**

Resource Class Specification	
Identifier	ISO_IEC_19788-1:2011::RC0001
Canonical identifier	ISO_IEC_19788-1::RC0001
Label	Resource
Name	Resource
Definition	Instances of this class are the entities that can be identified and referenced by an unambiguous and stable identifier in a recognized identification system.
Subclass of	-
Note	-

5.2 Resource class "Information Resource"

Resource Class Specification	
Identifier	ISO_IEC_19788-1:2023::RC0004
Canonical identifier	ISO_IEC_19788-1::RC0004
Label	Information Resource
Name	InformationResource
Definition	Instances of this class are the resources which have the property that all of its essential characteristics can be conveyed in a message.
Subclass of	ISO_IEC_19788-1::RC0001 (Resource)
Note	This class is the same as the class ISO_IEC_19788-1:0999::RC004 defined in the document ISO/IEC 19788-8:2015 (Annex E)

6 AfA Properties

6.1 Introduction

The properties defined in this standard are for use by those concerned with accessibility of resources, especially for people with disability. They are used for both Digital Resource Descriptions, as a MLR record (DRD), and stored Personal Needs and Preferences, also as a MLR record (PNP), facilitating the matching, by the user, a search engine, or a matching service, of resources to an individual user's needs. This is a common activity for properties such as author, title, etc. Multiple PNP may be used to provide for different user contexts and circumstances and for the potential delivery of combinations of resource components. In many cases, users with disability do not want to have to specify accessibility needs afresh but prefer to store them for reuse (as PNPs). Users with critical needs and references may rely on others to specify their needs for them.

The property `accessModeSufficient` in a DRD indicates modes and sets of modes that are available, in combination, to effectively deliver a given resource. For example, a resource may be accessible to a user who can interact visually, textually and with a mouse but also to a user who can only interact textually using a keyboard. This second set of modes matches the hypothetical PNP proposed in the following paragraph.

The property `accessModeSufficient` in a PNP declares explicitly what a user states they can do. For example, a user may state that for a given context they can interact with content visually, textually and using a keyboard. They may use a different PNP in a different context and other people may also choose to use their PNP because it is not a description of a person but of a set of needs.

Thus, a property value can be used in a DRD to describe the accessibility characteristics of a resource or the components of a resource. The same AfA properties (and values) can be used in a PNP to describe, for example, the chosen modes of sensory perception of or interaction with, a resource. That is, how the user chooses to engage or interact with the resource. The difference between a PNP and a DRD, as seen by a matching service, is that a DRD describes the accessibility properties of a particular resource and a PNP describes the set of those properties that will satisfy the user's needs.

In this standard, it is assumed that what is important to a given user is whether or not they can use the resource. Similarly, it is a principle applied in this standard that there is not a 'primary' or 'original' form of a resource if the resource is well-formed. That is, only where there are modifications of a resource so that it is a different resource might this information be relevant. An example would be where a resource depending on a technical diagram is completely replaced by a different, alternative text-based resource that conveys the same information without reference to imagery.

Given a typical video resource, for example, it may be indicated that the resource combines visual and auditory content. It may also have captions and a sound transcript that can replace the auditory content.

If these provide all the auditory content in the alternative form, the resource might also be described as usable visually, with no sound. In such a case, different users can work with different accessMode combinations (indicated by values of the accessModeSufficient property) while still enjoying access to all the content of the same resource.

It is recognized that users vary the conditions or context under which a particular need applies. It is assumed any given PNP will be the result of a process that defines one or more PNPs.

6.2 Specification of AfA properties

An AfA property specification will conform to the specification for an MLR property (ISO/IEC 19788-1) and hence it consists of an identifier (for the property specification) and a (defined) list of attributes with rules for the values of those attributes. Following ISO/IEC 19788-1, each property specification has the following attributes:

Essential: attributes:

- Identifier (an identifier for the property)
- Canonical identifier (a canonical identifier for the property)
- Label (a label for the property)
- Name (a name for the property)
- Definition (a definition for the property)
- Domain (a domain for the property)
- Codomain (a codomain for the property)
- Linguistic indicator (property linguistic indicator)
- Content value rules (rules governing the possible values for the property)

Non-essential attributes:

- Refines (a super-property for the property)
- Related to (a recognised similar property)
- Example(s) (some examples of use of the property)
- Note(s) (any additional information)
- Best Practice(s) (some good practices for using the property)
- Status (an information on the fact that the property is still in use)

It should be noted that in ISO/IEC 4932, an additional attribute, Related to, is used in the definition of properties.

The properties defined in this standard have a history. They were first identified for IMS Global Learning, then revised for ISO/IEC 24751-1:2008, then revised for schema.org and included in ePUB work and are now specified below to conform to ISO/IEC 19788. Here they are known as AfA properties: accessibilitySummary, accessMode, accessModeSufficient, accessibilityFeature, accessibilityControl, accessibilityHazard, accessibilityAPI.

It should be noted that resources seldom have only one value for an accessibility property. When users with disability indicate their needs, it may be they need a combination of values. A combination of values is different from multiple individual values. For these reasons, application profiles including accessibility properties will most likely sometimes need to specify that the properties are repeatable.

6.3 Accessibility summary

Property specification	
Essential attributes	
Identifier	ISO_IEC_4932:2023::P0001
Canonical identifier	ISO_IEC_4932::P0001
Label	accessibility summary
Name	accessibilitySummary
Definition	A human-readable summary of specific accessibility features or deficiencies, consistent with the other accessibility metadata
Domain	ISO_IEC_19788-1::RC0004 (<i>Information Resource</i>)
Codomain	literal
Linguistic indicator	linguistic
Content value rules	ISO_IEC_19788-1::PRS0001 (<i>MLR_STRING</i>)
Non-essential attributes	
Refines	-
Related to	https://schema.org/accessibilitySummary
Example(s)	-
Note	An accessibility summary may express subtleties such as "short descriptions are present but long descriptions will be needed for non-visual users" or "short descriptions are present and no long descriptions are needed". In general, it is useful to include details of additional features in common language as part of the value of accessibilitySummary rather than strike lots of new properties or refinements of existing properties.
Best practice(s)	https://www.w3.org/2021/a11y-discov-vocab/latest/#accessibilitySummary
Status	-

6.4 Access mode

Property specification	
Essential attributes	
Identifier	ISO_IEC_4932:2023::P0002
Canonical identifier	ISO_IEC_4932::P0002
Label	access mode
Name	accessMode
Definition	human sensory characteristics of a resource through which intellectual content is communicated
Domain	ISO_IEC_19788-1::RC0004 (<i>Information Resource</i>)
Codomain	literal
Linguistic Indicator	non-linguistic
Content value rules	RS_P0002
Non-essential attributes	
Refines	-
Related to	https://schema.org/accessMode
Example(s) ^{a)}	1. ISO_IEC_4932::V0001#T110 (<i>visual</i>) 2. ISO_IEC_4932::V0001#T010 (<i>auditory</i>)

Property specification	
Note(s)	1. An accessMode may be rendered usable when accompanied by a particular accessibility feature. Access modes can be combined for property accessModeSufficient to signal which combinations of access modes are sufficient for accessing/using the resource. 2. For a given resource, if more than one accessMode value is relevant, then repeat the use of the property.
Best practice(s)	https://www.w3.org/2021/a11y-discov-vocab/latest/#accessMode
Status	-

Rule_Set_Id: RS_P0002	
Rule_ID	Rule statement / Example(s) & Note(s)
01	The possible values are identifiers of terms from vocabulary ISO_IEC_4932::V0001 (<i>Access mode</i>).

6.5 Access mode sufficient

Property specification	
Essential attributes	
Identifier	ISO_IEC_4932:2023::P0003
Canonical identifier	ISO_IEC_4932::P0003
Label	access mode sufficient
Name	accessModeSufficient
Definition	A minimum set of resource access modes which together communicate all the semantic content of a resource
Domain	ISO_IEC_19788-1::RC0004 (<i>Information Resource</i>)
Codomain	<i>literal</i>
Linguistic Indicator	<i>non-linguistic</i>
Content value rules	ISO_IEC_4932::PRS0001[ISO_IEC_4932::V0002] (VOCABULARY TERM LIST [Access mode sufficient])
Non-essential attributes	
Refines	-
Related to	https://schema.org/accessModeSufficient
Example(s) ^{a)}	1. [ISO_IEC_4932::V0002#T030 (<i>textual</i>), ISO_IEC_4932::V0002#T040 (<i>visual</i>)] 2. [ISO_IEC_4932::V0002#T010 (<i>auditory</i>), ISO_IEC_4932::V0002#T020 (<i>tactile</i>)]
Note(s)	For a given resource, if more than one access mode sufficient value is relevant, then repeat the use of the property.
Best practice(s)	https://www.w3.org/2021/a11y-discov-vocab/latest/#accessModeSufficient
Status	-
^{a)} Labels appended to a vocabulary term identifier (parenthesis included) are not part of property values.	

6.6 Accessibility feature

Property specification	
Essential attributes	
Identifier	ISO_IEC_4932:2023::P0004
Canonical identifier	ISO_IEC_4932::P0004
Label	accessibility feature
Name	accessibilityFeature
Definition	An accessibility characteristic that renders accessible an otherwise inaccessible accessMode
Domain	ISO_IEC_19788-1::RC0004 (<i>Information Resource</i>)
Codomain	<i>literal</i>
Linguistic Indicator	<i>non-linguistic</i>
Content value rules	RS_P0004
Non-essential attributes	
Refines	-
Related to	https://schema.org/accessibilityFeature
Example(s) ^{a)}	1. ISO_IEC_4932::V0003#T120 (<i>captions</i>) 2. ISO_IEC_4932::V0003#T280 (<i>large print</i>)
Note(s)	1. If a resource has an <i>accessibility feature</i> 'captions', it renders accessible a resource with access mode 'auditory'. Similarly, a requirement for an <i>accessibility feature</i> such as 'reading order' renders unusable, content in <i>access mode</i> 'visual' that cannot be rendered auditorily successfully (for example, text arranged graphically). For resource providers and for users, properties showing specific features might need to be repeated. 2. For a given resource, if more than one <i>accessibility feature</i> value is relevant, then repeat the use of the property.
Best practice(s)	https://www.w3.org/2021/a11y-discov-vocab/latest/#accessibilityFeature
Status	-

Rule_Set_Id: RS_P0004	
Rule_ID	Rule statement / Example(s) & Note(s)
01	The possible values are identifiers of terms from vocabulary ISO_IEC_4932::V0003 (<i>Accessibility feature</i>).

6.7 Accessibility control

Property specification	
Essential attributes	
Identifier	ISO_IEC_4932:2023::P0005
Canonical identifier	ISO_IEC_4932::P0005
Label	accessibility control
Name	accessibilityControl
^{a)} Labels appended to a vocabulary term identifier (parenthesis included) are not part of property values.	